A. TITLE OF THE INVENTION

Travel Case for Transporting Insulin

B. CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

C. STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH/DEVELOPMENT

The present invention does not involve any form of federally sponsored research or development.

D. BACKGROUND OF THE INVENTION

The present invention relates generally to a container for transporting medicines requiring cold storage, and more specifically to a container used to transport insulin. Containers utilizing heat sinks are well known in the art, but are generally adapted for industrial use and not suitable for individual consumers, or at least not convenient for consumers.

One species of insulating carrying devices contains heat sinks comprising material that must first be cooled. United States Patent Nos. 4,250,998 to Taylor, 4,573,581 to Galloway et al., and 5,355,684 to Guice are representative of this type of container. This requirement of cooling the heat sink is undesirable because most travelers do not have refrigeration means readily available to them during trips, thus making this type of device unsuitable for long trips.

Other carrying devices comprise cryogenic technology. This type of device is wholly inconvenient and generally unavailable to the average consumer.

Thus, an unfulfilled need exists for a means to transport insulin for the average traveler. The present invention addresses this need by providing a convenient and inexpensive device suitable for transporting insulin. The heat sink is common ice, a material readily available at gas stations, restaurants, and lodging facilities, and is therefore conveniently replenished as needed by an average traveler.

E. BRIEF SUMMARY OF THE INVENTION

It is an object of the present invention to provide a device for transporting insulin and other medications requiring refrigeration. It is a further object of the invention to provide consumers an inexpensive and convenient means to keep medications cold during transport by providing a device whose heat sink can be replenished and recharged using means readily available to consumers at hotels and gas stations, namely ice machines and the like.

The invention comprises an outer bottle with an outer bottle cap, an inner bottle with an inner bottle cap, an inner cup, fins, and a means to thermally insulate the outer bottle.

The outer bottle has a bottom and a side wall, and an open top. An outer bottle cap is provided. The outer bottle cap is adapted to close and temporarily seal the top of the outer bottle so as to make the outer bottle water tight.

The inner bottle has a bottom and a side wall, and an open top. The inner bottle is contained within the outer bottle. An inner bottle cap is provided. The inner bottle cap is adapted to close and temporarily seal the top of the inner bottle so as to make the inner bottle water tight.

The inner cup is contained within the outer bottle. The inner cup comprises a bottom and a side wall and has an open top. The inner cup is adapted to receive the inner bottle.

The fins can be attached to and protruding radially from the side wall of the inner cup. The fins should be of such a width, width being defined as the distance from the inner cup side wall extending radially toward the outer bottle side wall, as to provide support to the inner cup by limiting the movement of the inner cup within the outer bottle. Alternatively, the fins can be attached to the side wall of the outer bottle. In this case, the fins protrude inwardly toward the side wall of the inner cup in a radial pattern. The fins act to keep the inner cup centrally located within and relative to the outer bottle, as well as to keep the inner cup in a substantially upright position within the outer bottle. In use, the inner cup holds the inner bottle. Because the fins act to keep the inner cup centrally located within and relative to the outer bottle, as well as to keep the inner cup in a

substantially upright position within the outer bottle, the inner bottle is likewise kept in a substantially upright and centrally located position within the outer bottle.

The means to insulate the outer bottle can be a distinct structure such as a thermally insulated soft or hard sided cooler adapted to receive and contain the outer bottle. The means to insulate the outer bottle can also be integral to the structure of the outer bottle itself wherein the bottom and side wall of the outer bottle are constructed of two layers with a gap in between the layers. The gap can contain air or some other suitable thermal insulating material. These materials are well known in the art of thermal insulation, and can comprise liquids, gases, polymeric foam material, natural fiber, and gelatinous heat sink type materials. The gap can also be a vacuum, making the outer bottle a type of vacuum bottle.

In use, a user adds ice to the outer bottle, filling with ice spaces defined by the fins, the outer bottle bottom, and the outer bottle side wall. The user places at least one bottle of insulin within the inner bottle and secures the inner bottle cap. The user then secures the outer bottle cap. If the means to insulate the outer bottle is a distinct structure, such as a soft sided cooler, the user places the outer bottle into the means to insulate. The ice functions as a heat sink, and maintains a constant temperature within the device during the gradual phase change of ice into liquid water. A bottle of insulin placed within the inner bottle would then be kept cold during the course of the phase change.

F. BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view of the outer bottle and cap.

FIG. 2 is a cross-section of the outer bottle and contents, viewed from the top down.

FIG. 3 is a longitudinal section of the lid, outer bottle, and contents.

FIG. 4 is a partial cross-section showing one possible embodiment of the device showing that the outer bottle may comprise an insulating layer.

FIG. 5 is an exterior view of the device as a whole, showing the outer bottle nestled within an outer insulating means.

FIG. 6 is a cross section of the device, including the outer insulating means, outer bottle, and contents of the outer bottle.

G. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

This invention is directed to a travel case for transporting insulin. The device **10** comprises an outer bottle **20** with an outer bottle cap **25**, an inner bottle with an inner bottle cap **35**, an inner cup **30**, fins **40**, and a means to thermally insulate the outer bottle **50**.

The outer bottle **20** has a bottom **21** and a side wall **22**, and an open top. An outer bottle cap **25** is provided. The outer bottle cap **25** is adapted to close and temporarily seal the top of the outer bottle **20** so as to make the outer bottle water tight.

The inner bottle has a bottom **31** and a side wall **32**, and an open top. The inner bottle is contained within the outer bottle **20**. An inner bottle cap **35** is provided. The inner bottle cap **35** is adapted to close and temporarily seal the top of the inner bottle so as to make the inner bottle water tight.

The inner cup **30** is contained within the outer bottle **20**. The inner cup **30** comprises a bottom and a side wall and has an open top. The inner cup is adapted to receive the inner bottle.

The fins **40** are attached to and protruding radially from the side wall **32** of the inner cup **30**. The fins **40** should be of such a width, width being defined as the distance from the inner cup side wall **32** extending radially toward the outer bottle side wall **22**, as to provide support to the inner cup **30** by limiting the movement of the inner cup within the outer bottle **20**. The fins **40** act to keep the inner cup **30** centrally located within and relative to the outer bottle **20**, as well as to keep the inner cup in a substantially upright position within the outer bottle. Alternatively, the fins **40** can be attached to and protruding inward from the side wall **22** of the outer bottle **20** toward the inner cup **30**.

The means to insulate **50** the outer bottle **20** can be a distinct structure such as a thermally insulated soft or hard sided cooler **53** adapted to receive and contain the outer bottle **20**. The means to insulate **50** the outer bottle **20** can also be integral to the structure of the outer bottle wherein the bottom **21** and side wall **22** of the outer bottle are constructed of two layers with a gap **54** between the layers. The gap **54** can contain air or some other suitable thermal insulating material. These materials are well known in the art of thermal insulation, and can comprise liquids, gases, polymeric foam material, natural fiber, and gelatinous heat sink type materials. The gap **54** can also be a vacuum, making the outer bottle a type of vacuum bottle.

In use, a user adds ice **60** to the outer bottle **20**, filling with ice spaces defined by the fins **40**, the outer bottle bottom **21**, and the outer bottle side wall **22**. The user places at least one bottle of insulin within the inner bottle **30** and secures the inner bottle cap **35**. The user then secures the outer bottle cap **25**. If the means to insulate **50** the outer bottle **20** is a distinct structure, such as a soft sided cooler **53**, the user places the outer bottle **20** into the means to insulate **50, 53**. The ice **60** functions as a heat sink, and maintains a constant temperature within the device **10** during the gradual phase change of ice into liquid water. A bottle of insulin placed within the inner bottle **30** would then be kept cold during the course of the phase change.